

<110> Ni et al.

<120> Bone Morphogenic Protein (BMP) Polynucleotides, Polypeptides, and Antibodies

<130> PT004P1

<140> Unassigned

<141> 2000-10-11

<150> PCT/US00/09028

<151> 2000-04-06

<150> 60/152,933

<151> 1999-09-09

<150> 60/147,020

<151> 1999-08-03

<150> 60/131,672

<151> 1999-04-29

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<151> 1999-04-23

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<170> PatentIn Ver. 2.0

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| tctcccgga | tcctgaggtc | acatgcgtgg | tggtggacgt | aagccacgaa | gaccctgagg | 180 |
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<213> Homo sapiens

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| cagagcatag | gacccctact | ccacgtcctc | ttccactccg | atggctccaa | gaattttgac | 180 |
| ggtttccatg | ccattttatga | ggagatcaca | gcatgctcct | catccccttg | tttccatgac | 240 |
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| gggcagcgct | gtgaaaatct | tctggaggct | gggaagtcca | agatcaaggc | gtcagaagat | 360 |
| tcattgtctg | tccttgaaga | aagaaactgc | tcagaccctg | ggggcccagt | caatgggtac | 420 |
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| gggtgagtag | acctccattg | ctggtaggct | gatgccacgt | ccactactag | gacagccaat | 1920 |
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| ctcccagcag | gccacagtca | ctgggcacca | ctaagctccg | gctgggtggc | ccagagagca | 180 |
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| attcatagac | ctcgagagtg | acaacctgtg | ccgctatgac | tttgtggatg | tgtacaatgg | 360 |
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| agaacagcct | gtcaccacca | cattccctgt | aaccacgggt | ttaaaacca | ccgtggcctt | 960 |
| gtgtcaacaa | aagtgtagac | ggacggggac | tctggagggc | aattattgtt | caagtgactt | 1020 |
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| ctcagtagaa | aaaaaaatac | ttataaaatt | acatattctg | aaagagsatt | ccgaaagatg | 1440 |
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<210> 6
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| caggcgcaat | gtgggtggctg | cttctctggg | gagtcctcca | ggcttgccca | acccggggct | 180 |
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| | | | | | | |
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<210> 7
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| | ctcccagcag | gccacagtca | ctgggcacca | ctaagctccg | gctggtgggc | ccagagagca | 180 |
| | agccagagga | gggcccgcctg | gaggtgtctg | accagggcca | gtggggcacc | gtgtgtgatg | 240 |
| | acaactttgc | tatccaggag | gccacagtgg | cttgccgcca | gctgggcttc | gaagctgcct | 300 |
| | tgacctgggc | ccacagtgcc | aagtacggcc | aaggggaggg | acccatctgg | ctggacaatg | 360 |
| | tgcgtgtgtg | gggcacagag | agctccttgg | accagtgcgg | gtctaattgg | tggggagtca | 420 |
| | gtgactgcag | tcaactcagaa | gacgtagggg | tgatatgcca | cccccgggcg | catcgtggct | 480 |
| | acctttctga | aactgtctcc | aatgcccttg | ggccccaggc | cggcggtctg | aggaggtcgg | 540 |
| | ctcaagccca | tccttgccag | tgccaagcag | catagcccag | tgaccgaggg | agccgtggag | 600 |
| | gtgaagttag | agggccactg | gcggcagggt | tgtgaccagg | gctggaccat | gaacaacagc | 660 |
| | aggggtggtg | gcgggatgct | gggcttcccc | agcgaggtgc | ctgtcgacag | ccactactac | 720 |
| | aggaaagtct | gggatctgaa | gatgaggggc | cctaagtcta | ggctgaagag | cctgacgaat | 780 |
| | aagaactcct | tctggatcca | ccaggtcacc | tgcttgggga | cagagcccca | catggccaac | 840 |
| | tgccaggtgc | aggtggctcc | agccccgggg | aaagctgcgg | cagcctgccc | aggtggcatg | 900 |
| | cacgctgtgg | tcagctgtgt | ggcagggcct | cacttccggc | caccgaagac | aaagccacaa | 960 |
| | cgcaaagggt | cctgggcaga | ggagccgagg | gtgcgcctgc | gctccggggc | ccaggtgggc | 1020 |
| | gagggccggg | tggaagtgtc | catgaaccgc | cagtggggca | cggtctgtga | ccacaggtgg | 1080 |
| | aacctcatct | ctgccagtgt | cgtgtgtcgt | cagctgggct | ttggctctgc | tcgggaggcc | 1140 |
| | ctctttgggg | cccggctggg | ccaagggcta | gggcccattc | acctgagtga | ggtgcgctgc | 1200 |
| | aggggatatg | agcggaccct | cagcgactgc | cctgccctgg | aaggggtcca | gaatggttgc | 1260 |
| | caacatgaga | atgatgtctg | tgtcagggtg | aatgtcccta | acatgggctt | tcagaatcag | 1320 |
| | gtgcgcttgg | ctggtggggc | tatccctgaa | gaggggctat | tggaggtgca | ggtggagggtg | 1380 |
| | aacgggggtc | cacgctgggg | gagcgtgtgc | agtgaaaact | gggggctcac | cgaagccatg | 1440 |
| | tgggcctgcg | gacagctcgg | cctgggtttt | gccatccatg | cctacaagga | aacctgggtc | 1500 |
| | tggtcgggga | gcccaagggc | ccaggagggtg | gtgatgagtg | gggtgcgctg | ctcaggcaca | 1560 |
| | gagctggccc | tgacagcagt | ccagaggcac | gggcccgtgc | actgctccca | cggtggcggg | 1620 |
| | cgcttcctgg | ctggagtctc | ctgcatggac | agtgcaccag | acctggtgat | gaacgcccag | 1680 |
| | ctagtgcagg | agacggccta | cttggaggac | cgcccgtca | gccagctgta | ttgtgcccac | 1740 |
| | gaggagaact | gcctctccaa | gtctgcgggc | gacgcggccg | cg | | 1782 |

<210> 8
 <211> 1504
 <212> DNA
 <213> Homo sapiens

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 <222> (326)
 <223> n equals a,t,g, or c

<220>
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<220>
 <221> SITE
 <222> (361)

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<223> n equals a,t,g, or c

<400> 8

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| gctcgtgccg | aattcggcac | gagcgggcacg | agctggggcca | gttctctcgc | aggtcccaga | 60 |
| tgtccagttc | cagatgcctg | gacccagagt | gtgggggaaa | tatctctgga | gaagccctca | 120 |
| ctccaaaggc | tgtccaggcg | caatgtgggtg | gctgcttctc | tggggagttcc | tccagggttg | 180 |
| cccaaccccg | ggctccgtcc | tcttggccca | agagctaccc | cagcagctga | catcccccg | 240 |
| gtacccagag | ccgtatggca | aaggccaaga | gagcagcacg | gacatcaagg | ctccagaagg | 300 |
| gctttgtgtg | gargctcgtc | ttccanggan | ttcgacctgg | agccgtccca | ggactgtgca | 360 |
| ngggactctg | tcacagttag | ctggggatgg | gggggggtccc | gccaggactg | tggccaggga | 420 |
| gattcccggg | gttgtgggaa | gtggcggtgc | cctgaatccc | ccatctggag | gagggatgaa | 480 |
| ttttccatgt | aggggcagtc | gggcttgggt | taccggggag | cagtgggtga | cccagggaca | 540 |
| cagcctccca | ccagcgcttc | cggggctgcc | atctggggccc | cacagagcaa | agagggcagc | 600 |
| aagcaggccc | tgcgtttgga | aggcttatga | atggacacac | aaatcttgca | aatctatgga | 660 |
| gccaggggca | gggacgcaca | tattggttgt | taaaaatatg | tcatcatgta | tttgttgagt | 720 |
| gcctgctcta | tcaggtgagg | aagctggaca | caaataataa | caaaagatta | agtccaccgtt | 780 |
| cacacttacc | ttggaagagc | tattacaaaa | cttctaacgc | caaagcctta | ttcagaataa | 840 |
| ggacatttta | aaaacagtac | ttgatggagt | gatgcaagct | tgcagtcca | gcagtatagt | 900 |
| caggagactg | aggctggagg | atcagarggc | tggagcccaa | ggttcaaggs | cagcctaagc | 960 |
| aacatagcaa | gaccccatct | caaaaataag | taaataataa | ataaaaaataa | aaagagcaca | 1020 |
| ttatcttttg | atttaaattt | tatttatatc | aaaatgacat | aaatttttga | actttatttt | 1080 |
| ttaattttta | aattttta | tattatggat | acataatagt | tgttaagactt | tttgtttttt | 1140 |
| aattaaagtt | ttctaaggct | gggcgcagta | gctcatgtct | gtagtcccag | cactttggga | 1200 |
| ggctgaggcg | aaagaagcac | ttgagcccag | gaatttgaga | ccagcctggg | caacatagca | 1260 |
| agaccccatc | tctacaaaaa | atttaaaaaa | tagccaagtg | tgggtggcacg | cacctgtggt | 1320 |
| cccagctaca | agggacgctg | aagttagagg | atcacttgag | cctggaaggt | agaggctgca | 1380 |
| gtgagctctg | atcatgacac | cgtactccag | cctgggtgac | agagttagac | cctgtctcca | 1440 |
| aaaaaaaaaa | aaaaaaaaac | gagggggggc | ccggggcccaa | ttcgccaaaa | ggggttccag | 1500 |
| atct | | | | | | 1504 |

<210> 9

<211> 570

<212> PRT

<213> Homo sapiens

<400> 9

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Ser | Leu | Glu | Phe | Asp | Tyr | Met | Cys | Gln | Tyr | Asp | Tyr | Val | Glu |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| | | | | | | | | | | | | | | | |
| Val | Arg | Asp | Gly | Asp | Asn | Arg | Asp | Gly | Gln | Ile | Ile | Lys | Arg | Val | Cys |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| | | | | | | | | | | | | | | | |
| Gly | Asn | Glu | Arg | Pro | Ala | Pro | Ile | Gln | Ser | Ile | Gly | Ser | Ser | Leu | His |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| | | | | | | | | | | | | | | | |
| Val | Leu | Phe | His | Ser | Asp | Gly | Ser | Lys | Asn | Phe | Asp | Gly | Phe | His | Ala |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| | | | | | | | | | | | | | | | |
| Ile | Tyr | Glu | Glu | Ile | Thr | Ala | Cys | Ser | Ser | Ser | Pro | Cys | Phe | His | Asp |
| | 65 | | | | 70 | | | | | 75 | | | | | 80 |
| | | | | | | | | | | | | | | | |
| Gly | Thr | Cys | Val | Leu | Asp | Lys | Ala | Gly | Ser | Tyr | Lys | Cys | Ala | Cys | Leu |
| | | | 85 | | | | | | 90 | | | | | 95 | |
| | | | | | | | | | | | | | | | |
| Ala | Gly | Tyr | Thr | Gly | Gln | Arg | Cys | Glu | Asn | Leu | Leu | Glu | Ala | Gly | Lys |
| | | | 100 | | | | | 105 | | | | | 110 | | |
| | | | | | | | | | | | | | | | |
| Ser | Lys | Ile | Lys | Ala | Ser | Glu | Asp | Ser | Leu | Ser | Val | Leu | Glu | Glu | Arg |
| | | 115 | | | | | 120 | | | | | 125 | | | |
| | | | | | | | | | | | | | | | |
| Asn | Cys | Ser | Asp | Pro | Gly | Gly | Pro | Val | Asn | Gly | Tyr | Gln | Lys | Ile | Thr |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| | | | | | | | | | | | | | | | |
| Gly | Gly | Pro | Gly | Leu | Ile | Asn | Gly | Arg | His | Ala | Lys | Ile | Gly | Thr | Val |
| 145 | | | | | 150 | | | | | 155 | | | | | 160 |

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Val Ser Phe Phe Cys Asn Asn Ser Tyr Val Leu Ser Gly Asn Glu Lys
 165 170 175
 Arg Thr Cys Gln Gln Asn Gly Glu Trp Ser Gly Lys Gln Pro Ile Cys
 180 185 190
 Ile Lys Ala Cys Arg Glu Pro Lys Ile Ser Asp Leu Val Arg Arg Arg
 195 200 205
 Val Leu Pro Met Gln Val Gln Ser Arg Glu Thr Pro Leu His Gln Leu
 210 215 220
 Tyr Ser Ala Ala Phe Ser Lys Gln Lys Leu Gln Ser Ala Pro Thr Lys
 225 230 235 240
 Lys Pro Ala Leu Pro Phe Gly Asp Leu Pro Met Gly Tyr Gln His Leu
 245 250 255
 His Thr Gln Leu Gln Tyr Glu Cys Ile Ser Pro Phe Tyr Arg Arg Leu
 260 265 270
 Gly Ser Ser Arg Arg Thr Cys Leu Arg Thr Gly Lys Trp Ser Gly Arg
 275 280 285
 Ala Pro Ser Cys Ile Pro Ile Cys Gly Lys Ile Glu Asn Ile Thr Ala
 290 295 300
 Pro Lys Thr Gln Gly Leu Arg Trp Pro Trp Gln Ala Ala Ile Tyr Arg
 305 310 315 320
 Arg Thr Ser Gly Val His Asp Gly Ser Leu His Lys Gly Ala Trp Phe
 325 330 335
 Leu Val Cys Ser Gly Ala Leu Val Asn Glu Arg Thr Val Val Val Ala
 340 345 350
 Ala His Cys Val Thr Asp Leu Gly Lys Val Thr Met Ile Lys Thr Ala
 355 360 365
 Asp Leu Lys Val Val Leu Gly Lys Phe Tyr Arg Asp Asp Arg Asp
 370 375 380
 Glu Lys Thr Ile Gln Ser Leu Gln Ile Ser Ala Ile Ile Leu His Pro
 385 390 395 400
 Asn Tyr Asp Pro Ile Leu Leu Asp Ala Asp Ile Ala Ile Leu Lys Leu
 405 410 415
 Leu Asp Lys Ala Arg Ile Ser Thr Arg Val Gln Pro Ile Cys Leu Ala
 420 425 430
 Ala Ser Arg Asp Leu Ser Thr Ser Phe Gln Glu Ser His Ile Thr Val
 435 440 445
 Ala Gly Trp Asn Val Leu Ala Asp Val Arg Ser Pro Gly Phe Lys Asn
 450 455 460
 Asp Thr Leu Arg Ser Gly Val Val Ser Val Val Asp Ser Leu Leu Arg
 465 470 475 480
 Glu Glu Gln His Glu Asp His Gly Ile Pro Val Ser Val Thr Asp Asn
 485 490 495
 Met Phe Cys Ala Ser Trp Glu Pro Thr Ala Pro Ser Asp Ile Cys Thr
 500 505 510

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Ala Glu Thr Gly Gly Ile Ala Ala Val Ser Phe Pro Gly Arg Ala Ser
 515 520 525
 Pro Glu Pro Arg Trp His Leu Met Gly Leu Val Ser Trp Ser Tyr Asp
 530 535 540
 Lys Thr Cys Ser His Arg Leu Ser Thr Ala Phe Thr Lys Val Leu Pro
 545 550 555 560
 Phe Lys Asp Trp Ile Glu Arg Asn Met Lys
 565 570

<210> 10
 <211> 573
 <212> PRT
 <213> Homo sapiens

<400> 10
 Met Ala Trp Ser Pro Pro Ala Thr Leu Phe Leu Phe Leu Leu Leu Leu
 1 5 10 15
 Gly Gln Pro Pro Pro Ser Arg Pro Gln Ser Leu Gly Thr Thr Lys Leu
 20 25 30
 Arg Leu Val Gly Pro Glu Ser Lys Pro Glu Glu Gly Arg Leu Glu Val
 35 40 45
 Leu His Gln Gly Gln Trp Gly Thr Val Cys Asp Asp Asn Phe Ala Ile
 50 55 60
 Gln Glu Ala Thr Val Ala Cys Arg Gln Leu Gly Phe Glu Ala Ala Leu
 65 70 75 80
 Thr Trp Ala His Ser Ala Lys Tyr Gly Gln Gly Glu Gly Pro Ile Trp
 85 90 95
 Leu Asp Asn Val Arg Cys Val Gly Thr Glu Ser Ser Leu Asp Gln Cys
 100 105 110
 Gly Ser Asn Gly Trp Gly Val Ser Asp Cys Ser His Ser Glu Asp Val
 115 120 125
 Gly Val Ile Cys His Pro Arg Arg His Arg Gly Tyr Leu Ser Glu Thr
 130 135 140
 Val Ser Asn Ala Leu Gly Pro Gln Ala Gly Gly Trp Arg Gly Arg Leu
 145 150 155 160
 Lys Pro Ile Leu Ala Ser Ala Lys Gln His Ser Pro Val Thr Glu Gly
 165 170 175
 Ala Val Glu Val Lys Tyr Glu Gly His Trp Arg Gln Val Cys Asp Gln
 180 185 190
 Gly Trp Thr Met Asn Asn Ser Arg Val Val Cys Gly Met Leu Gly Phe
 195 200 205
 Pro Ser Glu Val Pro Val Asp Ser His Tyr Tyr Arg Lys Val Trp Asp
 210 215 220
 Leu Lys Met Arg Asp Pro Lys Ser Arg Leu Lys Ser Leu Thr Asn Lys
 225 230 235 240
 Asn Ser Phe Trp Ile His Gln Val Thr Cys Leu Gly Thr Glu Pro His

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| 245 | | | | | | | | | | 250 | | | | | 255 | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| Met | Ala | Asn | Cys | Gln | Val | Gln | Val | Ala | Pro | Ala | Arg | Gly | Lys | Leu | Arg | | | | |
| | | | 260 | | | | | 265 | | | | | 270 | | | | | | |
| Pro | Ala | Cys | Pro | Gly | Gly | Met | His | Ala | Val | Val | Ser | Cys | Val | Ala | Gly | | | | |
| | | 275 | | | | | 280 | | | | | 285 | | | | | | | |
| Pro | His | Phe | Arg | Pro | Pro | Lys | Thr | Lys | Pro | Gln | Arg | Lys | Gly | Ser | Trp | | | | |
| | 290 | | | | | 295 | | | | | 300 | | | | | | | | |
| Ala | Glu | Glu | Pro | Arg | Val | Arg | Leu | Arg | Ser | Gly | Ala | Gln | Val | Gly | Glu | | | | |
| 305 | | | | | 310 | | | | | 315 | | | | | 320 | | | | |
| Gly | Arg | Val | Glu | Val | Leu | Met | Asn | Arg | Gln | Trp | Gly | Thr | Val | Cys | Asp | | | | |
| | | | | 325 | | | | | 330 | | | | | 335 | | | | | |
| His | Arg | Trp | Asn | Leu | Ile | Ser | Ala | Ser | Val | Val | Cys | Arg | Gln | Leu | Gly | | | | |
| | | | 340 | | | | | 345 | | | | | 350 | | | | | | |
| Phe | Gly | Ser | Ala | Arg | Glu | Ala | Leu | Phe | Gly | Ala | Arg | Leu | Gly | Gln | Gly | | | | |
| | | 355 | | | | | 360 | | | | | 365 | | | | | | | |
| Leu | Gly | Pro | Ile | His | Leu | Ser | Glu | Val | Arg | Cys | Arg | Gly | Tyr | Glu | Arg | | | | |
| | 370 | | | | | 375 | | | | | 380 | | | | | | | | |
| Thr | Leu | Ser | Asp | Cys | Pro | Ala | Leu | Glu | Gly | Ser | Gln | Asn | Gly | Cys | Gln | | | | |
| 385 | | | | | 390 | | | | | 395 | | | | | 400 | | | | |
| His | Glu | Asn | Asp | Ala | Ala | Val | Arg | Cys | Asn | Val | Pro | Asn | Met | Gly | Phe | | | | |
| | | | 405 | | | | | | 410 | | | | | 415 | | | | | |
| Gln | Asn | Gln | Val | Arg | Leu | Ala | Gly | Gly | Arg | Ile | Pro | Glu | Glu | Gly | Leu | | | | |
| | | | 420 | | | | | 425 | | | | | 430 | | | | | | |
| Leu | Glu | Val | Gln | Val | Glu | Val | Asn | Gly | Val | Pro | Arg | Trp | Gly | Ser | Val | | | | |
| | | 435 | | | | | 440 | | | | | 445 | | | | | | | |
| Cys | Ser | Glu | Asn | Trp | Gly | Leu | Thr | Glu | Ala | Met | Val | Ala | Cys | Arg | Gln | | | | |
| | 450 | | | | | 455 | | | | 460 | | | | | | | | | |
| Leu | Gly | Leu | Gly | Phe | Ala | Ile | His | Ala | Tyr | Lys | Glu | Thr | Trp | Phe | Trp | | | | |
| 465 | | | | 470 | | | | | 475 | | | | | | 480 | | | | |
| Ser | Gly | Thr | Pro | Arg | Ala | Gln | Glu | Val | Val | Met | Ser | Gly | Val | Arg | Cys | | | | |
| | | | | 485 | | | | | 490 | | | | | 495 | | | | | |
| Ser | Gly | Thr | Glu | Leu | Ala | Leu | Gln | Gln | Cys | Gln | Arg | His | Gly | Pro | Val | | | | |
| | | | 500 | | | | 505 | | | | | | 510 | | | | | | |
| His | Cys | Ser | His | Gly | Gly | Gly | Arg | Phe | Leu | Ala | Gly | Val | Ser | Cys | Met | | | | |
| | | 515 | | | | | 520 | | | | | 525 | | | | | | | |
| Asp | Ser | Ala | Pro | Asp | Leu | Val | Met | Asn | Ala | Gln | Leu | Val | Gln | Glu | Thr | | | | |
| | 530 | | | | | 535 | | | | | 540 | | | | | | | | |
| Ala | Tyr | Leu | Glu | Asp | Arg | Pro | Leu | Ser | Gln | Leu | Tyr | Cys | Ala | His | Glu | | | | |
| 545 | | | | | 550 | | | | | 555 | | | | | 560 | | | | |
| Glu | Asn | Cys | Leu | Ser | Lys | Ser | Ala | Val | Asp | Ala | Ala | Ala | | | | | | | |
| | | | | 565 | | | | | 570 | | | | | | | | | | |

<210> 11
 <211> 545
 <212> PRT

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<213> Homo sapiens

<400> 11

Met Pro Pro Phe Leu Leu Leu Thr Cys Leu Phe Ile Thr Gly Thr Ser
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 Val Ser Pro Val Ala Leu Asp Pro Cys Ser Ala Tyr Ile Ser Leu Asn
 20 25 30
 Glu Pro Trp Arg Asn Thr Asp His Gln Leu Asp Glu Ser Gln Gly Pro
 35 40 45
 Pro Leu Cys Asp Asn His Val Asn Gly Glu Trp Tyr His Phe Thr Gly
 50 55 60
 Met Ala Gly Asp Ala Met Pro Thr Phe Cys Ile Pro Glu Asn His Cys
 65 70 75 80
 Gly Thr His Ala Pro Val Trp Leu Asn Gly Ser His Pro Leu Glu Gly
 85 90 95
 Asp Gly Ile Val Gln Arg Gln Ala Cys Ala Ser Phe Asn Gly Asn Cys
 100 105 110
 Cys Leu Trp Asn Thr Thr Val Glu Val Lys Ala Cys Pro Gly Gly Tyr
 115 120 125
 Tyr Val Tyr Arg Leu Thr Lys Pro Ser Val Cys Phe His Val Tyr Cys
 130 135 140
 Gly His Phe Tyr Asp Ile Cys Asp Glu Asp Cys His Gly Ser Cys Ser
 145 150 155 160
 Asp Thr Ser Glu Cys Thr Cys Ala Pro Gly Thr Val Leu Gly Pro Asp
 165 170 175
 Arg Gln Thr Cys Phe Asp Glu Asn Glu Cys Glu Gln Asn Asn Gly Gly
 180 185 190
 Cys Ser Glu Ile Cys Val Asn Leu Lys Asn Ser Tyr Arg Cys Glu Cys
 195 200 205
 Gly Val Gly Arg Val Leu Arg Ser Asp Gly Lys Thr Cys Glu Asp Val
 210 215 220
 Glu Gly Cys His Asn Asn Asn Gly Gly Cys Ser His Ser Cys Leu Gly
 225 230 235 240
 Ser Glu Lys Gly Tyr Gln Cys Glu Cys Pro Arg Gly Leu Val Leu Ser
 245 250 255
 Glu Asp Asn His Thr Cys Gln Val Pro Val Leu Cys Lys Ser Asn Ala
 260 265 270
 Ile Glu Val Asn Ile Pro Arg Glu Leu Val Gly Gly Leu Glu Leu Phe
 275 280 285
 Leu Thr Asn Thr Ser Cys Arg Gly Val Ser Asn Gly Thr His Val Asn
 290 295 300
 Ile Leu Phe Ser Leu Lys Thr Cys Gly Thr Val Val Asp Val Val Asn
 305 310 315 320
 Asp Lys Ile Val Ala Ser Asn Leu Val Thr Gly Leu Pro Lys Gln Thr
 325 330 335

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Pro Gly Ser Ser Gly Asp Phe Ile Ile Arg Thr Ser Lys Leu Leu Ile
340 345 350

Pro Val Thr Cys Glu Phe Pro Arg Leu Tyr Thr Ile Ser Glu Gly Tyr
355 360 365

Val Pro Asn Leu Arg Asn Ser Pro Leu Glu Ile Met Ser Arg Asn His
370 375 380

Gly Ile Phe Pro Phe Thr Leu Glu Ile Phe Lys Asp Asn Glu Phe Glu
385 390 395 400

Glu Pro Tyr Arg Glu Ala Leu Pro Thr Leu Lys Leu Arg Asp Ser Leu
405 410 415

Tyr Phe Gly Ile Glu Pro Val Val His Val Ser Gly Leu Glu Ser Leu
420 425 430

Val Glu Ser Cys Phe Ala Thr Pro Thr Ser Lys Ile Asp Glu Val Leu
435 440 445

Lys Tyr Tyr Leu Ile Arg Asp Gly Cys Val Ser Asp Asp Ser Val Lys
450 455 460

Gln Tyr Thr Ser Arg Asp His Leu Ala Lys His Phe Gln Val Pro Val
465 470 475 480

Phe Lys Phe Val Gly Lys Asp His Lys Glu Val Phe Leu His Cys Arg
485 490 495

Val Leu Val Cys Gly Val Leu Asp Glu Arg Ser Arg Cys Ala Gln Gly
500 505 510

Cys His Arg Arg Met Arg Arg Gly Ala Gly Gly Glu Asp Ser Ala Gly
515 520 525

Leu Gln Gly Gln Thr Leu Thr Gly Gly Pro Ile Arg Ile Asp Trp Glu
530 535 540

Asp
545

<210> 12
<211> 294
<212> PRT
<213> Homo sapiens

<220>
<221> SITE
<222> (93)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (97)
<223> Xaa equals any of the naturally occurring L-amino acids

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Met Ala Met Phe Ser Ala Ala Glu Pro Asn Glu Arg Gly Asp Gln Tyr
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Cys Gly Gly Leu Leu Asp Arg Pro Ser Gly Ser Phe Lys Thr Pro Asn

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35 40 45
 Trp Pro Asp Arg Asp Tyr Pro Ala Gly Val Thr Cys Val Trp His Ile
 50 55 60
 Val Ala Pro Lys Asn Gln Leu Ile Glu Leu Lys Phe Glu Lys Phe Asp
 65 70 75 80
 Val Glu Arg Asp Asn Tyr Cys Arg Tyr Asp Tyr Val Xaa Val Phe Asn
 85 90 95
 Xaa Gly Glu Val Asn Asp Ala Arg Arg Ile Gly Lys Tyr Cys Gly Asp
 100 105 110
 Ser Pro Pro Ala Pro Ile Val Ser Glu Arg Asn Glu Leu Leu Ile Gln
 115 120 125
 Phe Leu Ser Asp Leu Ser Leu Thr Ala Asp Gly Phe Ile Gly His Tyr
 130 135 140
 Ile Phe Arg Pro Lys Lys Leu Pro Thr Thr Thr Glu Gln Pro Val Thr
 145 150 155 160
 Thr Thr Phe Pro Val Thr Thr Gly Leu Lys Pro Thr Val Ala Leu Cys
 165 170 175
 Gln Gln Lys Cys Arg Arg Thr Gly Thr Leu Glu Gly Asn Tyr Cys Ser
 180 185 190
 Ser Asp Phe Val Leu Ala Gly Thr Val Ile Thr Thr Ile Thr Arg Asp
 195 200 205
 Gly Ser Leu His Ala Thr Val Ser Ile Ile Asn Ile Tyr Lys Glu Gly
 210 215 220
 Asn Leu Ala Ile Gln Gln Ala Gly Lys Asn Met Ser Ala Arg Leu Thr
 225 230 235 240
 Val Val Cys Lys Gln Cys Pro Leu Leu Arg Arg Gly Leu Asn Tyr Ile
 245 250 255
 Ile Met Gly Gln Val Gly Glu Asp Gly Arg Gly Lys Ile Met Pro Asn
 260 265 270
 Ser Phe Ile Met Met Phe Lys Thr Lys Asn Gln Lys Leu Leu Asp Ala
 275 280 285
 Leu Lys Asn Lys Gln Cys
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<210> 13
 <211> 77
 <212> PRT
 <213> Homo sapiens

<400> 13
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 20 25 30
 Gly Tyr Pro Glu Pro Tyr Gly Lys Gly Gln Glu Ser Ser Thr Asp Ile
 35 40 45

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Lys Ala Pro Glu Gly Phe Ala Val Arg Leu Val Phe Gln Asp Phe Asp
50 55 60

Leu Glu Pro Ser Gln Asp Cys Ala Gly Thr Leu Ser Gln
65 70 75

<210> 14
<211> 170
<212> PRT
<213> Homo sapiens

<400> 14
Met Ala Trp Ser Pro Pro Ala Thr Leu Phe Leu Phe Leu Leu Leu Leu
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Gly Gln Pro Pro Pro Ser Arg Pro Gln Ser Leu Gly Thr Thr Lys Leu
20 25 30

Arg Leu Val Gly Pro Glu Ser Lys Pro Glu Glu Gly Arg Leu Glu Val
35 40 45

Leu His Gln Gly Gln Trp Gly Thr Val Cys Asp Asp Asn Phe Ala Ile
50 55 60

Gln Glu Ala Thr Val Ala Cys Arg Gln Leu Gly Phe Glu Ala Ala Leu
65 70 75 80

Thr Trp Ala His Ser Ala Lys Tyr Gly Gln Gly Glu Gly Pro Ile Trp
85 90 95

Leu Asp Asn Val Arg Cys Val Gly Thr Glu Ser Ser Leu Asp Gln Cys
100 105 110

Gly Ser Asn Gly Trp Gly Val Ser Asp Cys Ser His Ser Glu Asp Val
115 120 125

Gly Val Ile Cys His Pro Arg Arg His Arg Gly Tyr Leu Ser Glu Thr
130 135 140

Val Ser Asn Ala Leu Gly Pro Gln Ala Gly Gly Trp Arg Arg Ser Ala
145 150 155 160

Gln Ala His Pro Cys Gln Cys Gln Ala Ala
165 170

<210> 15
<211> 78
<212> PRT
<213> Homo sapiens

<220>
<221> SITE
<222> (62)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (63)
<223> Xaa equals any of the naturally occurring L-amino acids

<220>
<221> SITE
<222> (73)
<223> Xaa equals any of the naturally occurring L-amino acids

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<400> 15
 Met Trp Trp Leu Leu Leu Trp Gly Val Leu Gln Ala Cys Pro Thr Arg
 1 5 10 15
 Gly Ser Val Leu Leu Ala Gln Glu Leu Pro Gln Gln Leu Thr Ser Pro
 20 25 30
 Gly Tyr Pro Glu Pro Tyr Gly Lys Gly Gln Glu Ser Ser Thr Asp Ile
 35 40 45
 Lys Ala Pro Glu Gly Leu Cys Cys Glu Ala Arg Leu Pro Xaa Xaa Ser
 50 55 60
 Thr Trp Ser Arg Pro Arg Thr Val Xaa Gly Thr Leu Ser Gln
 65 70 75

<210> 16
 <211> 12
 <212> PRT
 <213> Homo sapiens

<400> 16
 Cys Ala Cys Leu Ala Gly Tyr Thr Gly Gln Arg Cys
 1 5 10

<210> 17
 <211> 46
 <212> PRT
 <213> Homo sapiens

<400> 17
 Cys Leu Ala Gly Tyr Thr Gly Gln Arg Cys Glu Asn Leu Leu Glu Ala
 1 5 10 15
 Gly Lys Ser Lys Ile Lys Ala Ser Glu Asp Ser Leu Ser Val Leu Glu
 20 25 30
 Glu Arg Asn Cys Ser Asp Pro Gly Gly Pro Val Asn Gly Tyr
 35 40 45

<210> 18
 <211> 51
 <212> PRT
 <213> Homo sapiens

<400> 18
 Tyr Ala Thr Pro Gly Ala Ile Val Ala Thr Phe Leu Lys Leu Ser Pro
 1 5 10 15
 Met Pro Leu Gly Pro Arg Pro Ala Ala Gly Gly Gly Arg Leu Lys Pro
 20 25 30
 Ile Leu Ala Ser Ala Lys Gln His Ser Pro Val Thr Glu Gly Ala Val
 35 40 45
 Glu Val Lys
 50

<210> 19
 <211> 50
 <212> PRT

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<213> Homo sapiens

<400> 19

Tyr Glu Gly His Trp Arg Gln Val Cys Asp Gln Gly Trp Thr Met Asn
1 5 10 15

Asn Ser Arg Val Val Cys Gly Met Leu Gly Phe Pro Ser Glu Val Pro
20 25 30

Val Asp Ser His Tyr Tyr Arg Lys Val Trp Asp Leu Lys Met Arg Asp
35 40 45

Pro Lys
50

<210> 20

<211> 51

<212> PRT

<213> Homo sapiens

<400> 20

Ser Arg Leu Lys Ser Leu Thr Asn Lys Asn Ser Phe Trp Ile His Gln
1 5 10 15

Val Thr Cys Leu Gly Thr Glu Pro His Met Ala Asn Cys Gln Val Gln
20 25 30

Val Ala Pro Ala Arg Gly Lys Leu Arg Pro Ala Cys Pro Gly Gly Met
35 40 45

His Ala Val
50

<210> 21

<211> 51

<212> PRT

<213> Homo sapiens

<400> 21

Val Ser Cys Val Ala Gly Pro His Phe Arg Pro Pro Lys Thr Lys Pro
1 5 10 15

Gln Arg Lys Gly Ser Trp Ala Glu Glu Pro Arg Val Arg Leu Arg Ser
20 25 30

Gly Ala Gln Val Gly Glu Gly Arg Val Glu Val Leu Met Asn Arg Gln
35 40 45

Trp Gly Thr
50

<210> 22

<211> 54

<212> PRT

<213> Homo sapiens

<400> 22

Val Cys Asp His Arg Trp Asn Leu Ile Ser Ala Ser Val Val Cys Arg
1 5 10 15

Gln Leu Gly Phe Gly Ser Ala Arg Glu Ala Leu Phe Gly Ala Arg Leu
20 25 30

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Gly Gln Gly Leu Gly Pro Ile His Leu Ser Glu Val Arg Cys Arg Gly
 35 40 45

Tyr Glu Arg Thr Leu Ser
 50

<210> 23
 <211> 53
 <212> PRT
 <213> Homo sapiens

<400> 23
 Asp Cys Pro Ala Leu Glu Gly Ser Gln Asn Gly Cys Gln His Glu Asn
 1 5 10 15

Asp Ala Ala Val Arg Cys Asn Val Pro Asn Met Gly Phe Gln Asn Gln
 20 25 30

Val Arg Leu Ala Gly Gly Arg Ile Pro Glu Glu Gly Leu Leu Glu Val
 35 40 45

Gln Val Glu Val Asn
 50

<210> 24
 <211> 51
 <212> PRT
 <213> Homo sapiens

<400> 24
 Gly Val Pro Arg Trp Gly Ser Val Cys Ser Glu Asn Trp Gly Leu Thr
 1 5 10 15

Glu Ala Met Val Ala Cys Arg Gln Leu Gly Leu Gly Phe Ala Ile His
 20 25 30

Ala Tyr Lys Glu Thr Trp Phe Trp Ser Gly Thr Pro Arg Ala Gln Glu
 35 40 45

Val Val Met
 50

<210> 25
 <211> 51
 <212> PRT
 <213> Homo sapiens

<400> 25
 Ser Gly Val Arg Cys Ser Gly Thr Glu Leu Ala Leu Gln Gln Cys Gln
 1 5 10 15

Arg His Gly Pro Val His Cys Ser His Gly Gly Gly Arg Phe Leu Ala
 20 25 30

Gly Val Ser Cys Met Asp Ser Ala Pro Asp Leu Val Met Asn Ala Gln
 35 40 45

Leu Val Gln
 50

<210> 26
 <211> 31

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<212> PRT

<213> Homo sapiens

<400> 26

Glu Thr Ala Tyr Leu Glu Asp Arg Pro Leu Ser Gln Leu Tyr Cys Ala
 1 5 10 15

His Glu Glu Asn Cys Leu Ser Lys Ser Ala Val Asp Ala Ala Ala
 20 25 30

<210> 27

<211> 443

<212> PRT

<213> Homo sapiens

<400> 27

Tyr Ala Thr Pro Gly Ala Ile Val Ala Thr Phe Leu Lys Leu Ser Pro
 1 5 10 15

Met Pro Leu Gly Pro Arg Pro Ala Ala Gly Gly Gly Arg Leu Lys Pro
 20 25 30

Ile Leu Ala Ser Ala Lys Gln His Ser Pro Val Thr Glu Gly Ala Val
 35 40 45

Glu Val Lys Tyr Glu Gly His Trp Arg Gln Val Cys Asp Gln Gly Trp
 50 55 60

Thr Met Asn Asn Ser Arg Val Val Cys Gly Met Leu Gly Phe Pro Ser
 65 70 75 80

Glu Val Pro Val Asp Ser His Tyr Tyr Arg Lys Val Trp Asp Leu Lys
 85 90 95

Met Arg Asp Pro Lys Ser Arg Leu Lys Ser Leu Thr Asn Lys Asn Ser
 100 105 110

Phe Trp Ile His Gln Val Thr Cys Leu Gly Thr Glu Pro His Met Ala
 115 120 125

Asn Cys Gln Val Gln Val Ala Pro Ala Arg Gly Lys Leu Arg Pro Ala
 130 135 140

Cys Pro Gly Gly Met His Ala Val Val Ser Cys Val Ala Gly Pro His
 145 150 155 160

Phe Arg Pro Pro Lys Thr Lys Pro Gln Arg Lys Gly Ser Trp Ala Glu
 165 170 175

Glu Pro Arg Val Arg Leu Arg Ser Gly Ala Gln Val Gly Glu Gly Arg
 180 185 190

Val Glu Val Leu Met Asn Arg Gln Trp Gly Thr Val Cys Asp His Arg
 195 200 205

Trp Asn Leu Ile Ser Ala Ser Val Val Cys Arg Gln Leu Gly Phe Gly
 210 215 220

Ser Ala Arg Glu Ala Leu Phe Gly Ala Arg Leu Gly Gln Gly Leu Gly
 225 230 235 240

Pro Ile His Leu Ser Glu Val Arg Cys Arg Gly Tyr Glu Arg Thr Leu
 245 250 255

Ser Asp Cys Pro Ala Leu Glu Gly Ser Gln Asn Gly Cys Gln His Glu

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| 260 | | | | | 265 | | | | | 270 | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Asp | Ala | Ala | Val | Arg | Cys | Asn | Val | Pro | Asn | Met | Gly | Phe | Gln | Asn |
| | | 275 | | | | | 280 | | | | | 285 | | | |
| Gln | Val | Arg | Leu | Ala | Gly | Gly | Arg | Ile | Pro | Glu | Gly | Leu | Leu | Glu | |
| | 290 | | | | | 295 | | | | | 300 | | | | |
| Val | Gln | Val | Glu | Val | Asn | Gly | Val | Pro | Arg | Trp | Gly | Ser | Val | Cys | Ser |
| | 305 | | | | | 310 | | | | | 315 | | | | 320 |
| Glu | Asn | Trp | Gly | Leu | Thr | Glu | Ala | Met | Val | Ala | Cys | Arg | Gln | Leu | Gly |
| | | | | 325 | | | | | 330 | | | | | 335 | |
| Leu | Gly | Phe | Ala | Ile | His | Ala | Tyr | Lys | Glu | Thr | Trp | Phe | Trp | Ser | Gly |
| | | | 340 | | | | | 345 | | | | | 350 | | |
| Thr | Pro | Arg | Ala | Gln | Glu | Val | Val | Met | Ser | Gly | Val | Arg | Cys | Ser | Gly |
| | | 355 | | | | | 360 | | | | | | 365 | | |
| Thr | Glu | Leu | Ala | Leu | Gln | Gln | Cys | Gln | Arg | His | Gly | Pro | Val | His | Cys |
| | 370 | | | | | 375 | | | | | 380 | | | | |
| Ser | His | Gly | Gly | Gly | Arg | Phe | Leu | Ala | Gly | Val | Ser | Cys | Met | Asp | Ser |
| | 385 | | | | | 390 | | | | | 395 | | | | 400 |
| Ala | Pro | Asp | Leu | Val | Met | Asn | Ala | Gln | Leu | Val | Gln | Glu | Thr | Ala | Tyr |
| | | | | 405 | | | | | 410 | | | | | 415 | |
| Leu | Glu | Asp | Arg | Pro | Leu | Ser | Gln | Leu | Tyr | Cys | Ala | His | Glu | Glu | Asn |
| | | | 420 | | | | | 425 | | | | | 430 | | |
| Cys | Leu | Ser | Lys | Ser | Ala | Val | Asp | Ala | Ala | Ala | | | | | |
| | | 435 | | | | | 440 | | | | | | | | |

<210> 28
 <211> 25
 <212> PRT
 <213> Homo sapiens

<400> 28
 Asp Glu Asn Glu Cys Glu Gln Asn Asn Gly Gly Cys Ser Glu Ile Cys
 1 5 10 15

Val Asn Leu Lys Asn Ser Tyr Arg Cys
 20 25

<210> 29
 <211> 42
 <212> PRT
 <213> Homo sapiens

<400> 29
 Arg Gly Gly Cys Gly Gly Ala Cys Val Pro Ala Arg Ala Pro Trp Gly
 1 5 10 15

Ala Asn Pro Glu Arg Leu Arg Cys His Glu Gly Arg Glu Arg Trp Ala
 20 25 30

Pro Leu Cys Leu Leu Leu Ala Ala Thr
 35 40

<210> 30

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<211> 45
 <212> PRT
 <213> Homo sapiens

<400> 30
 Gln Leu Ser Arg Gln Gln Ser Pro Glu Arg Pro Val Phe Thr Cys Gly
 1 5 10 15
 Gly Ile Leu Thr Gly Glu Ser Gly Phe Ile Gly Glu Gly Phe Pro Gly
 20 25 30
 Val Tyr Pro Pro Asn Ser Lys Cys Thr Trp Lys Ile Thr
 35 40 45

<210> 31
 <211> 56
 <212> PRT
 <213> Homo sapiens

<400> 31
 Val Pro Glu Gly Lys Val Val Val Leu Asn Phe Arg Phe Ile Asp Leu
 1 5 10 15
 Glu Ser Asp Asn Leu Cys Arg Tyr Asp Phe Val Asp Val Tyr Asn Gly
 20 25 30
 His Ala Asn Gly Gln Arg Ile Gly Arg Phe Cys Gly Thr Phe Arg Pro
 35 40 45
 Gly Ala Leu Ser Ser Gly Asn Lys
 50 55

<210> 32
 <211> 143
 <212> PRT
 <213> Homo sapiens

<400> 32
 Arg Gly Gly Cys Gly Gly Ala Cys Val Pro Ala Arg Ala Pro Trp Gly
 1 5 10 15
 Ala Asn Pro Glu Arg Leu Arg Cys His Glu Gly Arg Glu Arg Trp Ala
 20 25 30
 Pro Leu Cys Leu Leu Leu Ala Ala Ala Thr Gln Leu Ser Arg Gln Gln
 35 40 45
 Ser Pro Glu Arg Pro Val Phe Thr Cys Gly Gly Ile Leu Thr Gly Glu
 50 55 60
 Ser Gly Phe Ile Gly Glu Gly Phe Pro Gly Val Tyr Pro Pro Asn Ser
 65 70 75 80
 Lys Cys Thr Trp Lys Ile Thr Val Pro Glu Gly Lys Val Val Val Leu
 85 90 95
 Asn Phe Arg Phe Ile Asp Leu Glu Ser Asp Asn Leu Cys Arg Tyr Asp
 100 105 110
 Phe Val Asp Val Tyr Asn Gly His Ala Asn Gly Gln Arg Ile Gly Arg
 115 120 125
 Phe Cys Gly Thr Phe Arg Pro Gly Ala Leu Ser Ser Gly Asn Lys
 130 135 140

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